Applicant agrees that, in the prior art and as cited in Maestro at Col. 6, lines 17-19, wall thicknesses in chambers vary, for structural reinforcement as Maestro says, and also for achieving proper injection plastic flow. That variation is reflected in the runners and ribs of current chambers, as is the inadvertent thinning of some stretched film sections, which typifies vacuum formed objects. But there is no teaching about how to vary thickness with elevation, for any reason, and it is not obvious what variations in thickness might work. With respect the examiner's point about conservation of materials, any variation, e.g., with length, or all-over, would achieve such aim. So, in this respect the examiner is using hindsight for her rejection.

Accordingly claim 3 embraces a combination of chamber features which is not suggested and ought to be allowed.

With regard to claims 4 and 5: Claim 4 is better written, now. It and claim 5 ought at least to be allowed as a more particular embodiments of the claimed inventions of the allowable independent claims.

With regard to claim 15, Maestro at Col 6, line 64+ teaches a chamber more than 6 ft, not 4 ft, which is a teaching away from the invention. Notwithstanding, applicants have amended claim 15 to include matter in allowable claim 20. Thus, claim 15 ought to now be allowable.

With respect again to the July 21, 2004 IDS and certain other of the claims 19, 22, 23, 24 and 31 mentioned there. Even if examiner does not agree with applicants' point about novel and non-obvious combination, said claims and any other like claims ought to be allowed as particular embodiments of patentable inventions of the parent claims, if only so applicant may properly de-limit the parent claims.

Reconsideration and allowance of the claims is accordingly requested.

Respectfully submitted,

R. BROCHU ET AL.

By CGNessler
His Attorney

Charles G. Nessler
Box H
Chester, CT 06412
(860) 526 9149 Fax (860) 526 9149 email: cn@cnessler.com

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner of Patents, Box 1450, Alexandria VA 22313 on October 6, 2004

CGNessler
C. G. Nessler

Claims Status as of October 6, 2004

1. (currently amended) An arch shape cross section corrugated leaching chamber having a base, a top, and opposing sidewalls running upwardly from the base to the top, comprising:

a portion of sidewall, having a substantially constant thickness, running curvingly upward from proximity of the base toward the top of the chamber;

a plurality of perforations in said sidewall portion, spaced apart upwardly along the sidewall, running at substantially the same angle (SA) to the horizontal plane of the base;

wherein, the vertical height of perforation opening increases with perforation elevation from the base.

2. An arch shape cross section corrugated leaching chamber having a base, a top, and opposing sidewalls running upwardly from the base to the top, comprising:

a portion of sidewall running curvingly upward from proximity of the base toward the top of the chamber;

a plurality of substantially constant height perforations in said sidewall portion, spaced apart upwardly along the side wall, the plurality of perforations running at substantially the same angle (SA) to the horizontal plane of the base;

wherein, the thickness of the perforated sidewall decreases with elevation from the base.

3. An arch shape cross section leaching chamber having a base, a top, and opposing sidewalls running upwardly from the base to the top, comprising:

a portion sidewall of running curvingly upward from proximity of the base toward the top of the chamber;

a plurality of perforations in the sidewall portion, spaced apart upwardly along the side wall;

wherein, perforation height varies with elevation from the base;

and, wherein sidewall thickness varies with elevation from the base.

4. The chamber of claims 1, 2 or 3, wherein ~~substantially all of the perforated~~ the opposing sidewalls of the chamber, which are perforated have~~is~~ similar perforation height and sidewall thickness.

5. The chamber of claims 1, 2 or 3, wherein the Soil Threshold Angle (STA) of said plurality of perforations is substantially similar.

6. The chamber of claims 1, 2 or 3, buried in soil for use; wherein the Soil Threshold Angle (STA) of each perforation is less than the Repose Angle RA of said soil.

7. (currently amended) The chamber of claim 5, wherein the perforations are slots and wherein Soil Threshold Angle (STA) is less than about 30 degrees.

8. (currently amended) The chamber of claims 1, 2, or 3, wherein ~~STA~~ the Soil Threshold Angle (STA) of said plurality of perforations is less than about 26 degrees.

9. The chamber of claims 1, 2 or 3, wherein the chamber is comprised of peak and valley corrugations having a peak to peak pitch of less than about 8 inch.

10. The chamber of claim 3, wherein the perforations are slots having edge radii at the interior and exterior surfaces of the sidewall; and, wherein the sidewall is thicker at the upper part of the perforated sidewall, then at the lower part of the sidewall, near the base.

11. (currently amended) The chamber of claim 10~~9~~, wherein perforation height increases for slots at higher elevation from the base.

12. The chamber of claim 3, wherein perforation height and sidewall portion thickness decrease with elevation.

13. The chamber of claim 3, wherein the perforation height and sidewall thickness change uniformly with elevation.

14. The chamber of claim 3, wherein the perforations are outward flaring slots.

15. (currently amended) The chamber of claim 3, ~~wherein the chamber~~ made of a thermoplastic having a density in the range of 0.033-0.034 lb per cu inch, the chamber having an interior volume per foot of length of at least about 1.5 cu ft per ft, a slotted sidewall which is free of louvers, a leaching area to weight ratio of greater than about 100 square inch per pound, and~~has~~ a length of about 4 feet.

16. (currently amended) The chamber of claim 3, wherein the thickness of said perforated sidewall portion is less than ~~2~~ two times greater than the basic thickness of the chamber walls which are not perforated.

17. (currently amended) The chamber of claim 16~~15~~, wherein the perforations are slots.

18. (currently amended) The chamber of claim 17~~16~~ wherein the slots are flared inwardly, wherein the exterior opening heights of the slots range from about 0.07 to 0.09 inch, wherein the perforated sidewall portion thickness ranges from about 0.12 to 0.19 inch, and wherein the basic wall thickness is about 0.09 inch.

19. (currently amended) The chamber of claim 16~~15~~, wherein the basic thickness of the chamber is about 0.1 inch or less.

20. (currently amended) An arch shape cross section corrugated leaching chamber, made of a thermoplastic having a density in the range of 0.033-0.034 lb per cu inch, having an interior volume per foot of length of at least about 1.5 cu ft per ft, a slotted sidewall which is free of louvers, and a leaching area to weight ratio of greater than about 100 square inch per pound.

21. (currently amended) The chamber of claim 20~~19~~ wherein the ratio of leaching area to weight ratio is about 125 square inch per pound.

22. An arch shape cross section corrugated leaching chamber, made of a thermoplastic having a density in the range of 0.033-0.034 lb per cu inch, volume per foot of at least about 1.5 cu ft, and a weight per linear foot of less than 4 pounds.

23. (currently amended) The chamber of claim 22~~21~~, wherein the weight per linear foot is about 3 pounds.

24. (currently amended) The chamber of claim 20 or 22~~19 or 21~~, having a base width of about 34 inch, a height of about 13 inch, a slotted sidewall which is free of louvers.~~,~~

25. An arch shape cross section corrugated leaching chamber, made of a thermoplastic having a density in the range of 0.033-0.034 lb per cu inch, the chamber having a base width of about 34 inch, a slotted sidewall which is free of louvers, and a leaching area per unit length of at least 30 square inch per inch of length, and a weight of less than about 4 pounds per foot of chamber length.

26. (currently amended) For an arch shape cross section leaching chamber having a base, a top, and opposing perforated sidewalls running upwardly from the base to the top, the method of providing all the perforations with a Soil Threshold Angle (STA) greater than a predetermined value, which comprises: varying the wall thickness and height as a function of~~with~~ elevation from the base of the chamber.

27. (currently amended) The method of claim 26,~~25~~ wherein said predetermined value of Soil Threshold Angle (STA) is equal or less than the Repose Angle (RA) of soil for which the chamber use is intended.

28. (currently amended) The method of claim 26,~~25~~ wherein said predetermined value of Soil Threshold Angle (STA) is 26 degrees.

29. An arch shape cross section leaching made of molded thermoplastic, having a base, a top, and opposing sidewalls running curvingly upwardly from the base to the top, corrugations comprising peaks and valleys and connecting webs; the sidewall at the peaks and valleys thereof having slot perforations spaced apart upwardly along the sidewall; wherein the average wall thickness for the perforated portions of the sidewall is less than about 2.5 times the thickness of the basic wall thickness of unperforated portions of the chamber.

30. (currently amended) The chamber of claim 29~~28~~, wherein the slot perforations all have a Soil Threshold Angle (STA) of no more than about 26 degrees.

31. (currently amended) The chamber of claim 30~~28~~, wherein corrugations have a pitch spacing of 6 to 7 inch.

Page 9, first full paragraph

In a preferred chamber of the present invention, sidewall thickness varies from 0.15-0.18 inch, and thus the ratio of perforated sidewall thickness to basic wall thickness 0.09 inch ranges from 1.72 to 1~~1.~~ ~~7-2 to 1~~, and averages about 1.85 to 1. The foregoing ratio is called the sidewall thickness ratio. It compares with a ratio of about 4 to 1, characteristic of prior art chambers. Designers of prior art chambers had reasons for the thick sidewall, even though that increased weight and cost. The combination of technology that comprises the present invention achieves substantially lowered sidewall thickness ratios, while still achieving STA which is effective, e.g. 26 degrees

Page 10, first full paragraph

Fig. 5 is a vertical cross section through a sidewall 40C of a preferred chamber 20C, which is generally like chamber 20. Fig. 4 is side elevation view of the same chamber. See also Fig. 10 and 11 for details of the slots, discussed further below. Slots 30C, 30 have central axes LL, which slope downwardly at angle SA of about 12 degrees from horizontal. Preferably, the slots are flared inwardly with an about 12 degree included angle, as described further below, and in co-pending patent application serial No. 10/677,772 of Swistak et al., ~~(Atty. No. 2313) of Burnes et al.,~~ entitled Leaching Chamber with Inward Flaring Sidewall Perforations, filed on even date herewith, the disclosure of which is hereby incorporated by reference. In chamber 20C, slot height hx (i.e., height h which is measured at the sidewall exterior surface) becomes progressively larger with slot elevation from the base, increasing from about 0.070 inch at the bottom to about 0.090 inch at the top. The vertical edge-to-edge spacing of the slots is about 0.100 inch, measured along the rise or curve of the sidewall. The basic wall thickness t of the chamber away from the perforated wall is about 0.090 inch; and, that is the thickness at the top 42C. In Fig.5, the thickness of the perforated chamber sidewall increases from ta of about 0.150 inch at the bottom to tb of about 0.175 inch, nominally 0.180 inch, near the top. The preferred design will be further appreciated from the descriptions that follow. Fig. 15 is an isometric view of a whole chamber 20C having features of a preferred embodiment. Fig. 15 illustrates the open ends of the chamber and how they are configured for connecting to other chambers.

Page 14, first paragraph

Fig. 11 shows a typical slot 30 for which height h changes with slot depth (which also may be called the through-wall length), so the slot flares outwardly toward the chamber exterior. Fig. 12 shows preferred typical slot 30 which flares inwardly toward the chamber interior 21, so the minimum height h of the slot, namely hx, is at the exterior surface. The downward slope angle SA is preferably 12 degrees; and, the included angle FA of the flare is preferably about 12 degrees. Chambers having slots 30 are formed by molds which have slides that retract into the core portion of the mold, that is, inwardly from the sidewall exterior, as detailed in the aforementioned Brochu~~Burnes~~ et al. application serial number 10/677,772~~(Attorney No. 2313)~~. The slots of preferred embodiment chamber 20C are shaped like those in Fig. 11. In the generality of the present invention, the other configurations of slots which have been described may be used.

In the Abstract:

A continuous curve arch shape cross section leaching chamber made of molded thermoplastic has closely spaced corrugations and sidewalls which are perforated with slots which slope downwardly, running from interior to exterior of the chamber. The slot height and or wall thickness vary with slot elevation from the base, to achieve ~~so that~~ a desired minimum Soil Threshold Angle (STA) in the slots, where said STA angle parameter relates to resistance to ~~that is shape which resists~~ entry of surrounding soil~~, is achieved for all slots~~. Slotted wall thickness is less than about two ~~2~~ times the thickness of the basic chamber wall thickness elsewhere. The chamber has properties and performance approximating prior art chambers, but has substantially less normalized weight and total weight.

Page 9, first full paragraph

In a preferred chamber of the present invention, sidewall thickness varies from 0.15-0.18 inch, and thus the ratio of perforated sidewall thickness to basic wall thickness 0.09 inch ranges from 1.72 to 1 , and averages about 1.85 to 1. The foregoing ratio is called the sidewall thickness ratio. It compares with a ratio of about 4 to 1, characteristic of prior art chambers. Designers of prior art chambers had reasons for the thick sidewall, even though that increased weight and cost. The combination of technology that comprises the present invention achieves substantially lowered sidewall thickness ratios, while still achieving STA which is effective, e.g. 26 degrees

Page 10, first full paragraph

Fig. 5 is a vertical cross section through a sidewall 40C of a preferred chamber 20C, which is generally like chamber 20. Fig. 4 is side elevation view of the same chamber. See also Fig. 10 and 11 for details of the slots, discussed further below. Slots 30C, 30 have central axes LL, which slope downwardly at angle SA of about 12 degrees from horizontal. Preferably, the slots are flared inwardly with an about 12 degree included angle, as described further below, and in co-pending patent application serial No. 10/677,772 of Swistak et al., entitled Leaching Chamber with Inward Flaring Sidewall Perforations, filed on even date herewith, the disclosure of which is hereby incorporated by reference. In chamber 20C, slot height hx (i.e., height h which is measured at the sidewall exterior surface) becomes progressively larger with slot elevation from the base, increasing from about 0.070 inch at the bottom to about 0.090 inch at the top. The vertical edge-to-edge spacing of the slots is about 0.100 inch, measured along the rise or curve of the sidewall. The basic wall thickness t of the chamber away from the perforated wall is about 0.090 inch; and, that is the thickness at the top 42C. In Fig.5, the thickness of the perforated chamber sidewall increases from ta of about 0.150 inch at the bottom to tb of about 0.175 inch, nominally 0.180 inch, near the top. The preferred design will be further appreciated from the descriptions that follow. Fig. 15 is an isometric view of a whole chamber 20C having features of a preferred embodiment. Fig. 15 illustrates the open ends of the chamber and how they are configured for connecting to other chambers.

Page 14, first paragraph

Fig. 11 shows a typical slot 30 for which height h changes with slot depth (which also may be called the through-wall length), so the slot flares outwardly toward the chamber exterior. Fig. 12 shows preferred typical slot 30 which flares inwardly toward the chamber interior 21, so the minimum height h of the slot, namely hx, is at the exterior surface. The downward slope angle SA is preferably 12 degrees; and, the included angle FA of the flare is preferably about 12 degrees. Chambers having slots 30 are formed by molds which have slides that retract into the core portion of the mold, that is, inwardly from the sidewall exterior, as detailed in the aforementioned Brochu et al. application serial number 10/677,772. The slots of preferred embodiment chamber 20C are shaped like those in Fig. 11. In the generality of the present invention, the other configurations of slots which have been described may be used.

In the Abstract

A continuous curve arch shape cross section leaching chamber made of molded thermoplastic has closely spaced corrugations and sidewalls which are perforated with slots which slope downwardly, running from interior to exterior of the chamber. The slot height and or wall thickness vary with slot elevation from the base, to achieve a desired minimum Soil Threshold Angle in the slots, where said Angle parameter relates to resistance to entry of surrounding soil. Slotted wall thickness is less than about two times the thickness of the basic chamber wall thickness elsewhere. The chamber has properties and performance approximating prior art chambers, but has substantially less normalized weight and total weight.

OIPE JC71
OCT 0 8 2004
PATENT & TRADEMARK OFFICE

ATTY. C NESSLER #2229 BROCHU

10/6/04 marked to show deleted numbers

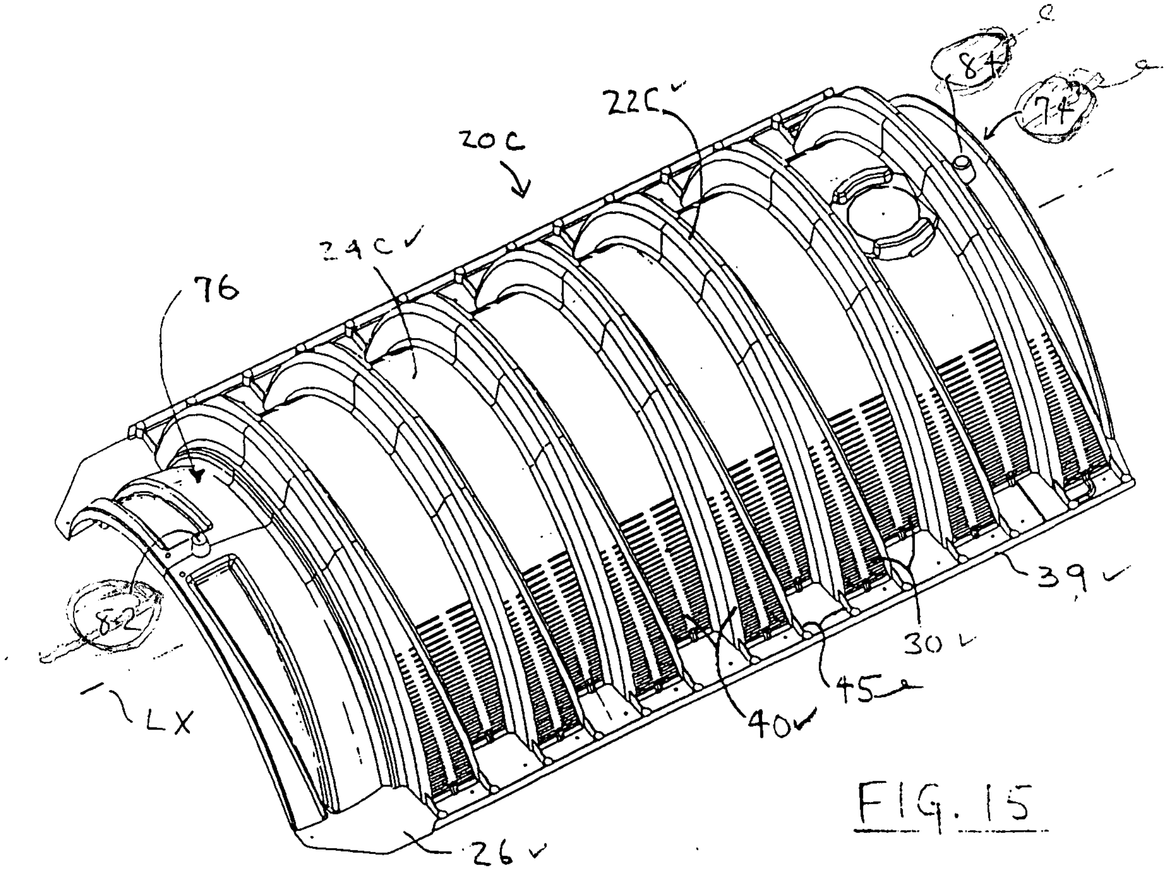

FIG. 15